

by Mackay and now in the Davenport Fern Herbarium is presumably authentic. As previously noted, there is no doubt that Michaux's *Nephrodium tenue*, from southern Quebec, belongs here, though his name cannot be used in the varietal category.

Where *C. fragilis*, forma *magnasora* Clute, Fern Bulletin ix. 65 (1901) belongs, I do not know.

EXPLANATION OF PLATE 383

Fig. 1, Frond of *Cystopteris fragilis*, var. *protrusa* $\times \frac{1}{2}$; 1a, pinna of the same $\times 1$, both from *Biltmore Herb.* no. 144c; 2, pinna of var. *Mackayii* $\times 1$, from a specimen collected at Hartford, Vermont, by *Kennedy*; 3, pinna of *f. simulans* $\times 1$, from the type specimen; 4, pinna of typical *C. fragilis*, $\times 1$, from a specimen collected by Collins & Fernald at Rivière du Loup, Quebec; 5, indusium of vars. *Mackayii* and *protrusa*, approximately $\times 20$; 6, indusium of typical *C. fragilis*, approximately $\times 15$. Both indusia after Schkuhr.

GRAY HERBARIUM.

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—NO. CIX.

MIDSUMMER VASCULAR PLANTS OF SOUTHEASTERN VIRGINIA

M. L. FERNALD

(Plates 384–405)

STIMULATED by the success of the brief botanical trip to Princess Anne and Norfolk Counties, Virginia, made by Mr. Griscom and me in September, 1933, and reported upon in the paper, *Three Days of Botanizing in Southeastern Virginia*,¹ I induced Mr. Bayard Long to join me for a midsummer trip to the same area in 1934. Mr. Griscom being then in Europe it was necessary to forego his always cheerful and stimulating companionship. Accompanied by my son, Mr. Henry G. Fernald, as chauffeur and photographer, Mr. Long and I reached Virginia Beach on July 27. We had expected to stay four or five days but the pressure of interesting plants and those new to the area forced us to prolong the stay until August 9; and even then, on our last half-day in the field we brought in more than a score of species not previously reported from Princess Anne County. When we left, therefore, we were fully aware of the vast amount of exploration still needed and the desirability of further studies in the region.

¹ Fernald & Griscom, RHODORA, xxxvii. 129–157, 167–189, plates 332–351. Contrib. Gray Herb. no. cvii (1935).

The hot midsummer days, with temperatures daily reaching or exceeding 37.7° C (100° F) and an atmospheric humidity near 80, are the feast-times of chiggers (red-bugs) and ticks. Consequently, the call for a minimum of clothing, coupled with the necessity for perfect protection against invaders, strongly convinced us that, climatically at least, the region was one in which the austro-riparian flora should luxuriate. Kearney, in his very detailed study of the area, *Report on a Botanical Survey of the Dismal Swamp Region*,¹ has already so satisfactorily described the country, its climate and vegetation that it is necessary here merely to refer to that preliminary publication. Covering a vastly greater area than we and concentrating on the Dismal Swamp, which we barely reached in our westernmost collecting, Kearney had a broad outlook upon the whole flora but, naturally, he could not detect local spots of great interest but limited extent which we were able to find. Other such spots are doubtless numerous but as yet undetected by the botanist; and, surely, many areas once of great botanical interest are now hopelessly lost to the botanist through the deep ditching which has generally prevailed. Thus, the extensive area of the Green Sea, thence across the formerly wet stretch of almost uninhabited country between Grassfield and Cornland, the area at the northeast edge of the Dismal Swamp, bounded by Wallacetown, Northwest, Great Bridge and the Herring Canal, must originally have been a region of boggy pinebarren; but today, wherever not under cultivation, it is a hopelessly uninteresting cane- or reed-brake. By sheer good luck we got into one limited spot in this area which had not yet quite dried out. Here the Savannah or Pond Pine, *Pinus serotina* Michx., a species not seen by Kearney, still persists in spite of the draining; and in this remnant of a once extensive area of wet barrens we found the last lingering relics of the original flora: *Panicum lucidum* Ashe, *Cyperus retrorsus* Chapm., var. *Deeringianus* (Britton & Small) Fern. & Griscom, *Rynchospora microcephala* Britton, *R. gracilentia* Gray, *Carex venusta* Dew., var. *minor* Boeckl. and *Ludwigia pilosa* Walt. and *L. linearis* Walt., all but the last species not seen by Kearney. Many species of wet or dry pinebarrens, unsupported by modern (or? any) authenticating specimens, have been included in our northern Manuals as occurring in southern Virginia (*Mayaca Aubleti* Michx., *Syngonanthus flavidulus* (Michx.) Ruhl., *Bartonia verna* (Michx.) Muhl., etc.). It is quite clear that the proper habitats for such plants have been largely exterminated through draining and subsequent cultivation of the land.

¹ Thomas H. Kearney, Contrib. U. S. Nat. Herb. v. no. 6, pp. 321-585 (1901).

Another factor which is rapidly destroying the remnants of native vegetation which still linger in southeastern Virginia is the universal custom of turning rich woodlands into pig-pastures or dumps. So long as Man feels as he generally does, that the earth and its natural products were God-given to Man for his personal exploitation and destruction it is perhaps hopeless to expect any of Nature's wonderful gifts to be preserved for later generations. But it is not man and pig alone who are making the havoc. The ubiquitous and unrestrained Japanese Honeysuckle, *Lonicera japonica*, is doing its utmost to strangle everything which originally grew in the borders of wooded swamps or thickets. Even the strongly armored species of *Smilax* become hopelessly entangled by it and more delicate shrubs and herbs are soon obliterated. If the "CCC" survives, nothing more beneficial to future generations in our Southeast could be devised than a vigorous warfare against the Japanese Honeysuckle, the ruthless and exterminating "yellow peril" of the South.

Other limited areas with highly specialized floras were found. As distinctive as any is a small patch of peaty, sandy and slightly boggy swale between the backs of the coastal dunes and the fresh-water ponds south of the Rifle Range, below Rudy Inlet (between Virginia Beach and Dam Neck). Search from Cape Henry to the North Carolina border, below False Cape, has failed to reveal another spot like it, with its concentration of local plants of damp sands and peats, the following of them not reported by Kearney from this region of Virginia: *Axonopus furcatus* (Flügge) Hitchc., *Panicum ensifolium* Baldw., *Gymnopogon brevifolius* Trin., *Rynchospora rariflora* (Michx.) Ell., *R. cymosa*, var. *globularis* Chapm., *R. Wrightiana* Boeckl., *Juncus Elliottii* Chapm., a remarkable new *Hypoxis*, not closely related to other American species, *Sabatia gracilis* (Michx.) Salisb., and *Lobelia Nuttallii* R. & S.

Farther south, in the damp depressions in the sand between Back Bay and the dunes of False Cape is another area of localized coastal plain plants, the following noteworthy as not in Kearney's report from the county: *Cyperus Haspan* L., *Dichromena colorata* (L.) Hitchc., *Eleocharis albida* Torr. and *E. Lindheimeri* (Clarke) Svenson (extension east from Texas), *Rynchospora caduca* Ell., *Juncus megacephalus* M. A. Curtis, *Ranunculus hederaceus* L., *Ludwigia brevipes* (Long) E. H. Eames, *Hydrocotyle ranunculoides* L. f. and, extended south from the head of Chesapeake Bay, *Limosella subulata* Ives.

The rich woodlands, as already noted by Mr. Griscom and me,



Photo. E. C. Ogden.

ASPLENIUM PLATYNEURON: FIG. 3, pinnae, $\times 1$.
A. PLATYNEURON, var. EUROAUSTRINUM: FIG. 1, plant, $\times \frac{2}{5}$; FIG. 2, pinna, $\times 1$.



Photo. E. C. Ogden.

SAGITTARIA WEATHERBIANA: FIG. 1, flowering plant and separate inflorescence, $\times \frac{1}{2}$ (TYPE); FIG. 2, dilated filaments and anthers, $\times 10$, from TYPE; FIGS. 3-6, mature achenes, $\times 10$.

contain many species of the interior most unexpected on the outer edge of the coastal plain, close to the Atlantic. Several such species are enumerated by Kearney. Our browsings brought to light many other plants of rich woods, several of them amazingly remote from their inland centers: *Thelypteris hexagonoptera* (Michx.) Weath., *Panicum Boscii* Poir., *Liparis liliifolia* (L.) Richard, *Goodyera pubescens* (Willd.) R. Br., *Aristolochia Serpentaria* L., *Arenaria lanuginosa* (Michx.) Rohrb., *Aquilegia canadensis* L., *Asimina triloba* (L.) Dunal, *Agrimonia parviflora* Ait. and *A. mollis* (T. & G.) Britton, *Angelica villosa* (Walt.) BSP., *Sabatia brachiata* Ell., *Galium uniflorum* Michx., *Vernonia glauca* Willd. and *Antennaria Parlinii* Fern., *A. fallax* Greene and *A. solitaria* Rydb. Isolation from the interior is well illustrated by *Vernonia glauca*, a characteristic plant, as Small expresses it, of "Wooded slopes and riverbanks, various provinces N of Coastal Plain, Ga. to Ala., Pa. and N. J." Yet in the woods near Little Creek it is less than a mile from the sea.

From these introductory notes it will be apparent that the southeastern counties of Virginia still support a flora of real interest, one which we are just beginning to know, although the activities of Man have severely diminished it. In view of the very detailed list already published by Kearney it will be useful to have on record all species collected by us which he did not record from our limited area (Princess Anne and Norfolk Counties) and which were not recorded in the paper by Griscom and me. The numbers cited are of herbarium specimens collected as vouchers. We spent one night before reaching Virginia Beach at Wachapreague in Accomac County. Although Accomac County is north of the entrance to Chesapeake Bay a few records of range-extensions there are here included. In a few cases additional stations discovered by Mr. Griscom and me in September, 1933 (and not previously reported) or in May, 1935, or by Griscom, Long and myself in June, 1935, are included; but in the main the later collections await further study before a report upon them will be justified.

The accompanying report contains numerous technical plates, the photographs, chiefly by Mr. E. C. OGDEN, made possible through a grant from the Milton Fund for research of Harvard University. The expense of their reproduction has been most generously met by Mr. BAYARD LONG.

ENUMERATION OF NOTEWORTHY SPECIES COLLECTED¹

THELYPTERIS NOVEBORACENSIS (L.) Nieuwl. Frequent, often abundant, in rich woods, both counties: Little Neck, Princess Anne Co., no. 3608.

T. PALUSTRIS Schott, var. *PUBESCENS* (Lawson) Fern. Swamps or inundated woods, frequent in both counties: north of Blackwater River, no. 3610.

T. HEXAGONOPTERA (Michx.) Weath. Moist or swampy woods, Little Neck, no. 3609. Seen in 1935 in abundance on Great Neck and nearer Virginia Beach.

ASPLENIUM PLATYNEURON (L.) Oakes. Frequent in woodlands, northern half of Princess Anne Co.: rich woods east of Little Creek, no. 3602.

ASPLENIUM PLATYNEURON (L.) Oakes, var. **euroaustrium**, var. nov. (TAB. 384, FIGS. 1 et 2), frondibus fertilibus submembranaceis 2–5 dm. longis 3–7.5 cm. latis; pinnis anguste lanceolatis apice acutis vel subacutis valde serratis; soris maturis distinctis non confluentibus.—Florida to Louisiana, north to Kentucky and southeastern Virginia. TYPE: rich, mixed woods, Munden, Princess Anne Co., Virginia, August 1, 1934, *Fernald & Long*, no. 3603 (in Gray Herb.).

Var. *euroaustrium* is the extreme development, gigantic for the species, in the warm region of the southeastern United States. Its most important character is in the remote sori which, when fully ripe, remain distinct, instead of becoming promptly confluent as in the wide-ranging typical *Asplenium platyneuron*. The latter is frequent to common in eastern Virginia in good soils; but var. *euroaustrium* was seen by us only in woodlands of most austral aspect at the extreme southeastern corner of the state but it was collected by Heller in Southampton Co., about Franklin, *Heller*, no. 1147. All material in the Gray Herbarium from Florida belongs to var. *euroaustrium*. For comparison mature pinnae from typical *A. platyneuron*, our no. 3602, from east of Little Creek, Princess Anne Co., is included in the plate as FIG. 3.

I am retaining *Asplenium platyneuron* (L.) Oakes in order to avoid further changes in the nomenclature of the common species which for two generations has been passing under that name. The history and the application of the name are about as shaky as any of the Linnean definitions of American plants, based upon confused and quite inadequate knowledge. Nomenclaturally *Asplenium platyneuron* rests upon *Acrostichum platyneuron* L. Sp. Pl. ii. 1069 (1753), a treatment copied directly (with the omission of the original diagnosis) from the

¹ Unless otherwise designated the collectors are *Fernald & Long*; the collections of *Fernald & Griscom* are cited as of *F. & G.*; those of *Fernald, Griscom & Long* as of *F. G. & L.*

dissertation on *Acrostichum* of Linnaeus's pupil, Johann Benjamin Heiligtag, and published in L. Amoen. Acad. i. 156 (1749).

The treatment in Heiligtag's dissertation was as follows:

10. *ACROSTICHUM frondibus pinnatis, pinnis alternis ovatis crenatis sessilibus sursum arcuatis. Gron. virg. 123.*

Filix Polypodium dicta minima virginiana platyneuros. Pluk. alm. 153. t. 289. f. 2. Raj. app. 58.

Asplenium virginianum, polypodii facie. Raj. app. 59.

Polypodium minus virginianum, foliis brevibus subtus argenteis. Moris. hist. 3. p. 563. s. 14. t. 2. f. 6.

Habitat in Virginia.

Facies Polypodii officinarum.

Stipites nudi, alterni, palmares.

Frons pinnata lobis alternis, obtusis, integerrimis, obverse ovatis, aut oblongis, sursum arcuatis, basi coadunatis; aversa foliorum pars alba pulvere ferrugineo adspersa.

Morisoni datum synonymon huc spectat, licet ipse hoc idem conjungat cum specie octava.

The account in *Species Plantarum* was essentially identical but ended with "*Habitat in Virginia.*"

Taking up the citations as they are given in *Species Plantarum*, the first, *Acrostichum frondibus alternatim pinnatis, foliolis ovatis crenatis sessilibus, sursum arcuatis* of Gronovius, was based primarily upon Clayton's no. 14 (*Trichomanes foliis minoribus, caule nigro splendente*). The Clayton specimen, studied by Asa Gray in 1839, was recorded by him on the margin of the copy of Gronovius used by him for that purpose as *Asplenium ebeneum* Ait. That identification, the only satisfactory evidence that *Acrostichum platyneuron* was an *Asplenium*, was promptly taken as typifying the species; and, since this typification was accepted without question by Moore, Hooker, D. C. Eaton and others, it is better to let it so stand.

The other bases of *Acrostichum platyneuron* are wholly a sad mixture of *Polypodium virginianum* L. and *P. polypodioides* (L.) Watt. *Filix Polypodium dicta minima Virginiana platyneuros* of Plukenet, from which the specific name *platyneuron* was, obviously, taken, rests on a conventionalized figure of a *Polypodium virginianum*. This figure shows a rachis somewhat exaggerated by shadow, which could well be described "platyneuros." Ray took over the Plukenet species and added to the citation "*vide Asplenium Virginianum Polypodii facie D. Pet.*" This plant, the 2nd listed by Linnaeus as identical with that of Clayton (or Gronovius), was well described by Ray as a hand's breadth high, with the pinnae as in *Polypodium*, the fruit as in *Asplenium* (possibly meaning something quite outside our present

Asplenium), the fruiting side of the frond whitish and roughened with ferruginous dots (*Seminalia autem exanthemata ferruginei coloris non sunt sed albicantes punctulis ferrugineis aspera*). The latter character could have been drawn only from *Polypodium polypodioides*; yet Ray went on to state that his species is Plukenet's *Filix Polypodium dicta minima Virginiana platyneuros*, already shown to be the smooth *P. virginianum*. Morison's *Polypodium minus virginianum, foliis brevibus subtus argenteis* was likewise undoubted *P. polypodioides*; the figure is unequivocal and the description is perfect.

Returning to the original (or compiled) diagnosis in the dissertation on *Acrostichum*, it is clear that Linnaeus and his student, Heiligtag, were confused: "*Facies Polypodii officinarum*" was certainly a sufficient indication of *Polypodium*; "*Stipites nudi, alterni, palmares*" actually describes the stipes of *Polypodium virginianum*, not the very short and tufted stipes of the *Asplenium*; "*lobis . . . integerimis, obverse ovatis . . . sursum arcuatis*" is perfectly good for *Polypodium*, not for the *Asplenium*; and surely "*aversa foliorum pars alba pulvere ferrugineo adspersa*," the phrase taken right out of Ray, could apply to nothing but *Polypodium polypodioides*.

If we typify *Acrostichum platyneuron* by most of the literary references and by the clear but compiled diagnosis in *Amoen. Acad.* we can arrive only at a mixture of *Polypodium virginianum* and *P. polypodioides*, both bearing Linnean specific epithets dating from 1753. Only by ignoring all the confused and quite misunderstood references to *Polypodium* and putting the weight on the plant of Clayton which Gronovius described, which Linnaeus studied (but misunderstood) and which Gray, Moore, Hooker and others selected as the true basis of *Acrostichum platyneuron*, can we save the name in its current application. In view of the consensus of good usage it is wisest to let it so stand; but the case is a perfect one to place before those philosophical but usually botanically inexperienced enthusiasts who think that typification or elucidation of the muddled concepts of early authors can be properly accomplished by means of a single RULE. A rule which in one case would conserve an established usage in another would do the opposite, unless we can agree that in these old and obscure medleys typification was accomplished by the student who first selected one element to stand as typical. Such a rule as that would conserve most names. A rule which arbitrarily designates the first citation or the first plate or the diagnosis would often do havoc to usage. The diagnosis of *Acrostichum platyneuron*, for example, applies not to *Asplenium* but to two species of *Polypodium*.

ATHYRIUM ASPLENIODES (Michx.) Desv. Common in moist woods and swamps, highly variable in size, attenuation of pinnae and color (green or rufescent): Little Neck, nos. 3604, 3605; Oceana, no. 3606.

BOTRYCHIUM VIRGINIANUM (L.) Sw. Rich woods, occasional in both counties: Little Neck, no. 3612; east of Little Creek, *F. & G.*, no. 4291; near Benefit, *F. & G.*, no. 4292.

All the material has more oblong and blunter pinnules than the plant of the Northeast and of the Alleghenian region. It is presumably typical *B. virginianum*, the type of which is now being compared with it in London.

B. DISSECTUM Spreng. Dry, mixed woods, Little Neck, no. 3613.

B. DISSECTUM, forma *OBLIQUUM* (Muhl.) Fern. With the latter, no. 3614.

LYCOPodium INUNDATUM L., var. *BIGELOVII* Tuckerm. Damp or wet peaty or sandy depressions near the coast: The Desert, Cape Henry, no. 3615; Rifle Range, south of Rudy Inlet, no. 3616.

PINUS SEROTINA Michx. Common in wet peaty soil of southern Norfolk Co., from the northeast corner of the Dismal Swamp eastward across the Green Sea: south of Grassfield, no. 3618.

TYPHA ANGUSTIFOLIA L., var. *ELONGATA* (Dudley) Wiegand (var. *virginica* Tidestrom.). Marshes and margins of ponds and creeks, Princess Anne Co.: margin of Owl Creek, Virginia Beach, no. 3621.

One of Tidestrom's original collections of his var. *virginica* was from Cape Henry.

TYPHA TRUXILLENSIS HBK. Nov. Gen. et Sp. i. 68 (1815). *T. latifolia* **domingensis* Pers. Syn. ii. 532 (1807). *T. domingensis* (Pers.) Kunth, Enum. iii. 92 (1841). VIRGINIA: border of salt marsh by Back Bay, Munden, no. 3623; border of Nowney Creek, Back Bay, *F. G. & L.*, no. 4530. NORTH CAROLINA: brackish marsh of Back Bay, east of Morse Point, Currituck Co., no. 3622, *F. G. & L.*, no. 4529.

Typha truxillensis is very conspicuous on the brackish marsh, near the causeway leading from south of Munden to Knott's Island, North Carolina and Virginia. It there grows in intimate association with *T. angustifolia* L., and the contrast between the two could hardly be better demonstrated: *T. angustifolia* comparatively low, with few dark-green, subherbaceous, plano-convex leaves and deep reddish-brown spikes; *T. truxillensis* twice as tall, the 10± very pale and coriaceous flat leaves overtopped by the whitish-brown spikes, so very tall as to give special point to two of the names under which it has passed: *T. gigantea* Schur (1865) and *T. maxima* Schur (1905). After collecting and photographing *T. truxillensis* within the limits of North Carolina we made a point of visiting the marshes of Back Bay slightly to the north, within Virginia, where it is equally abundant.

In mid-June, 1935, it was barely in anthesis, whereas *T. latifolia* and *T. angustifolia* were in young fruit (with staminate flowers shriveled).

Typha truxillensis (as *T. domingensis*) is recorded by Graebner in Engler's Pflanzenr. iv⁸. 14 (1900) from temperate¹ and tropical South America, Central America and the West Indies, northward to southern California, Texas and Louisiana. It is in the Gray Her-

¹ In view of the abundance of *Typha truxillensis* (*T. domingensis*) in temperate South America, it is difficult to understand the statement of Mr. J. Hutchinson (Fam. Fl. Pl. ii. Monoc. 128 (1934)): "TYPHA; absent from America and Africa south of the equator." There are many specimens of *T. truxillensis* (often misidentified as *T. angustifolia* and even as *T. latifolia*) in the Gray Herbarium from southern Brazil, Uruguay and Argentina, from between lat. 30° and 35° S. In his *Contributions to the Flora of North Patagonia*, Journ. Linn. Soc. xxi. 236 (1884), John Ball wrote of it (as *T. angustifolia*): "Extends from the valleys of North Patagonia through the provinces of Buenos Ayres and Entrerios." A sheet of this material in the Gray Herbarium is typical *T. truxillensis*. But Ball's conclusion regarding the dispersal of "This cosmopolitan species" should be modified, since *T. truxillensis* is purely American. In 1894, Kronfeld in Martius, Fl. Bras. iii³. 642, gave the range of *T. domingensis*: "Habitat in Americae regionibus inter 35. circulum parall. longitudinis septentrionalis et Patagoniam sitis inclusa India occidentalis"; and he cited many specimens from south of the equator. Graebner in Pflanzenr. iv⁸ gives *T. domingensis* a similar range: "südlich bis nach Buenos-Aires und Nordpatagonien." Our collections extend the range to lat. 36° 40' N.

As to the absence of *Typha* from "Africa south of the equator," reference merely to *Index Kewensis*, Kronfeld's monographic study in 1889 and Graebner's treatment in *Das Pflanzenreich* would have been sufficient to show that *T. capensis* came from South Africa, that *T. latifolia*, proles *Hildebrandtii* occurs only on Madagascar and that *T. angustifolia*, subsp. *australis* grows in Zanzibar, the Transvaal and at the Cape of Good Hope!

Unfortunately others of Hutchinson's statements of the geographic areas occupied by groups have to be carefully checked or treated with easy-going liberality: for instance, his brief summaries under *Lophotocarpus* (p. 34), the *Xyridaceae* (pp. 61 and 63) and *Hemerocallis* (p. 91). The broad range of the *Xyridaceae* (the genus *Xyris*) is given: "Warmer regions of the world, usually in saline marshes; numerous species in Florida." I have personally known *Xyris* in the field for nearly half-a-century, but I never saw it in saline soil. Small, including the "numerous species [about 20] in Florida," rightly assigns them all fresh habitats, 15 of the species in "pinelands," which are not saline. Of the 28 species in *Flora Brasiliensis* only 1 is assigned a possibly maritime habitat (with no statement that it is saline). "Trop. and Subtropics," given as the range of *Xyris*, surely needs some qualification as a statement of the occurrence of a genus ranging from 42° S. lat. to 50° N. lat. Similarly "Tropics generally" for *Lophotocarpus*, which grows northward to northeastern New Brunswick (47° N., the latitude of the Loire, central Switzerland or the Tirol) and to Oregon, is not fully satisfactory; and "HEMEROCALLIS (Calif.)" for a well-known Eurasian genus, which is found in California only in gardens, is inexplicable unless one supposes it to have arisen through confusion with the western American *Hesperocallis*, but in the same paragraph Hutchinson correctly assigns *Hesperocallis* to California. Every one may make occasional slips but, when such misstatements are numerous and put forward with seeming finality, they increase the reader's scepticism regarding the deductions drawn and the fundamental changes of classification proposed. The natural caution about following Hutchinson in removing *Allium* and its allies from the *Liliaceae* and transferring them to the *Amaryllidaceae* or in severing the *Resedaceae* from the *Papaverales* and placing them in the *Violales* seems justified. In some cases, however, Hutchinson puts a single genus into two groups: thus *Kyllinga* (p. 196) is placed in the tribe *Rynchosporae* and also in the tribe *Cypereae*. If that is possible, why should not a genus belong to two families and a family to two orders?

barium also from Lee Co., Florida (*J. P. Standley*, no. 141). Its abundance about Back Bay indicates that in the Carolinas and Georgia it has presumably been confused with *T. angustifolia*.

SAGITTARIA FALCATA Pursh. Salt to brackish or fresh marshes and river-margins, seen at Munden and on the marshes of North Landing River and its tributary, Blackwater River: Munden, no. 3625.

This is doubtless the plant listed by Kearney as *S. lancifolia* L. *S. falcata* was long confused with the latter species of tropical and subtropical America; it has the bracts of the inflorescence short, blunt and coarsely papillate, whereas the bracts of *S. lancifolia* (known in Florida) are lance-attenuate, much-prolonged and smooth.

SAGITTARIA Weatherbiana, sp. nov. (TAB. 385 et TAB. 386, FIG. 1), planta 4–9 dm. alta; rhizomate breve et crasso, stolonibus elongatis apice tuberosis; foliis exterioribus membranaceis lineari-oblongis obtusis vel subacutis 1.5–2.5 cm. latis; foliis interioribus longe petiolatis, petiolo erecto 2–4.5 dm. longo crasso, basi dilatato-amplexante; limbo lanceolato vel oblanceolato vel elliptico utrinque acuminato 1.2–2.5 dm. longo 2.5–7.5 cm. lato submembranaceo perviridi 5–7-nervo; scapo erecto 3–6 dm. alto; inflorescentiis monoicis vel dioecis verticellis 3–6 remotis, flores longe et graciliter pedicellatis, pedicellis 2.5–6.5 cm. longis ante anthesin adscendentibus postea divaricatis; bracteis 3 scariosis ovato-acuminatis basi coalitis 5–10 mm. longis; sepalis ovatis 6–9 mm. longis, post anthesin reflexis; petalis obovatis lacteis 1–1.5 cm. longis; staminibus 12–18, filamentis complanatis basi dilatatis pubescentibus, antheris lineari-oblongis fere basifixis 2–2.5 mm. longis; carpellis maturis complanatis anguste et oblique cuneato-obovatis 2–2.5 mm. longis 1–1.5 mm. latis utrinque anguste alatis, alis tenuibus, parietibus costis 1–3 elongatis instructis vel ecostatis, stylo subulato vix 0.5 mm. longo.—Southeastern Virginia to eastern South Carolina. VIRGINIA: in water of gum swamp south of North Landing, Norfolk Co., August 7, 1934, *Fernald & Long*, no. 3624, disintegrating material, distributed as *S. cycloptera* (J. G. Smith) Mohr; open pools in gum swamp north of Land of Promise (same region as above), May 7, 1935, in flower, *Fernald & Griscom*, no. 4297, TYPE in Gray Herb.); same station, June 18, 1935, in over-ripe fruit, *Fernald, Griscom & Long*, no. 4536. NORTH CAROLINA: shallow water of roadside excavation, Washington, Beaufort Co., April 15, 1932, in flower, *Weatherby*, no. 6086, distributed as *S. lancifolia* L. SOUTH CAROLINA: marsh, Longwood Island, Waccamaw River, Horry Co., April 22, 1932, in flower, *Weatherby & Griscom*, no. 16,395, distributed as *S. lancifolia* L.

Sagittaria Weatherbiana has been confused, it will be noted, with both *S. cycloptera* and *S. lancifolia*; it is also somewhat allied to *S. graminea* Michx. and it superficially resembles *S. ambigua* J. G. Sm. From *S. graminea* with which, as well as with *S. cycloptera*, it shares

dilated filaments, it differs in its greater size in all parts, *S. graminea* having narrower and long-acuminate phyllodia; slender-petioled inner or later leaves, with blades very rarely up to 1.5 dm. long and 3 cm. broad; pedicels at most 3 cm. long; bracts blunt and at most 6 mm. long; anthers (PLATE 386, FIG. 2) ellipsoid or rounded and only 0.6–1 mm. long; achenes (PLATE 386, FIGS. 3–5) 1.5–2 mm. long. *S. graminea* flowers in the North (Newfoundland, southern Labrador and Ontario thence into the northernmost States) from late June to September, in the southern part of its range (Delaware, District of Columbia, southern Indiana, Missouri and Texas) from late May to August; *S. Weatherbiana* is one of the earliest species, flowering in April and early May, its mature achenes essentially all dropped by mid-June.

S. Weatherbiana in foliage closely simulates *S. ambigua*. That species of Missouri, Kansas and Oklahoma, however, has lance-attenuate, very slender-tipped and papillate bracts 1–1.5 cm. long and essentially free to the base; pedicels only 1.5–3.5 cm. long; filaments (PLATE 386, FIG. 6) filiform-subulate (not dilated below); and shorter and much more rounded achenes (PLATE 386, FIG. 7). *S. Weatherbiana* only superficially resembles *S. ambigua*.

The newly proposed species, when Mr. Long and I first collected it, was placed provisionally in *S. cycloptera*, awaiting adequate flowering and fruiting material. The differentiating characters are many: *S. cycloptera* has an elongate rhizome; narrow (3–12 mm. wide) and long-attenuate phyllodia; slender-petioled later leaves, with linear-lanceolate blades; pedicels 1–3 cm. long; anthers (PLATE 386, FIG. 8) 0.8–1.2 mm. long; and achenes (PLATE 386, FIGS. 9 and 10) with very conspicuously developed dorsal keel.

From *Sagittaria lancifolia* the more northern *S. Weatherbiana* differs in many characters. *S. lancifolia*, a tropical American species, unknown north of Florida, has coriaceous blades, firm lanceolate bracts up to 3 cm. long; pistillate pedicels shorter than to about twice as long as their subtending bracts; filaments (PLATE 386, FIG. 11) slender (not dilated); achenes (PLATE 386, FIGS. 12 and 13) 2.5–3 mm. long, with thickened dorsal keel; a species far removed from *S. Weatherbiana*.

The northeastern representative of *Sagittaria lancifolia* is *S. falcata* Pursh, extending north to Delaware and Maryland. Like *S. lancifolia* it has firm or coriaceous pale-green leaves, quite different from the dark-green and submembranaceous blades of *S. Weatherbiana*.

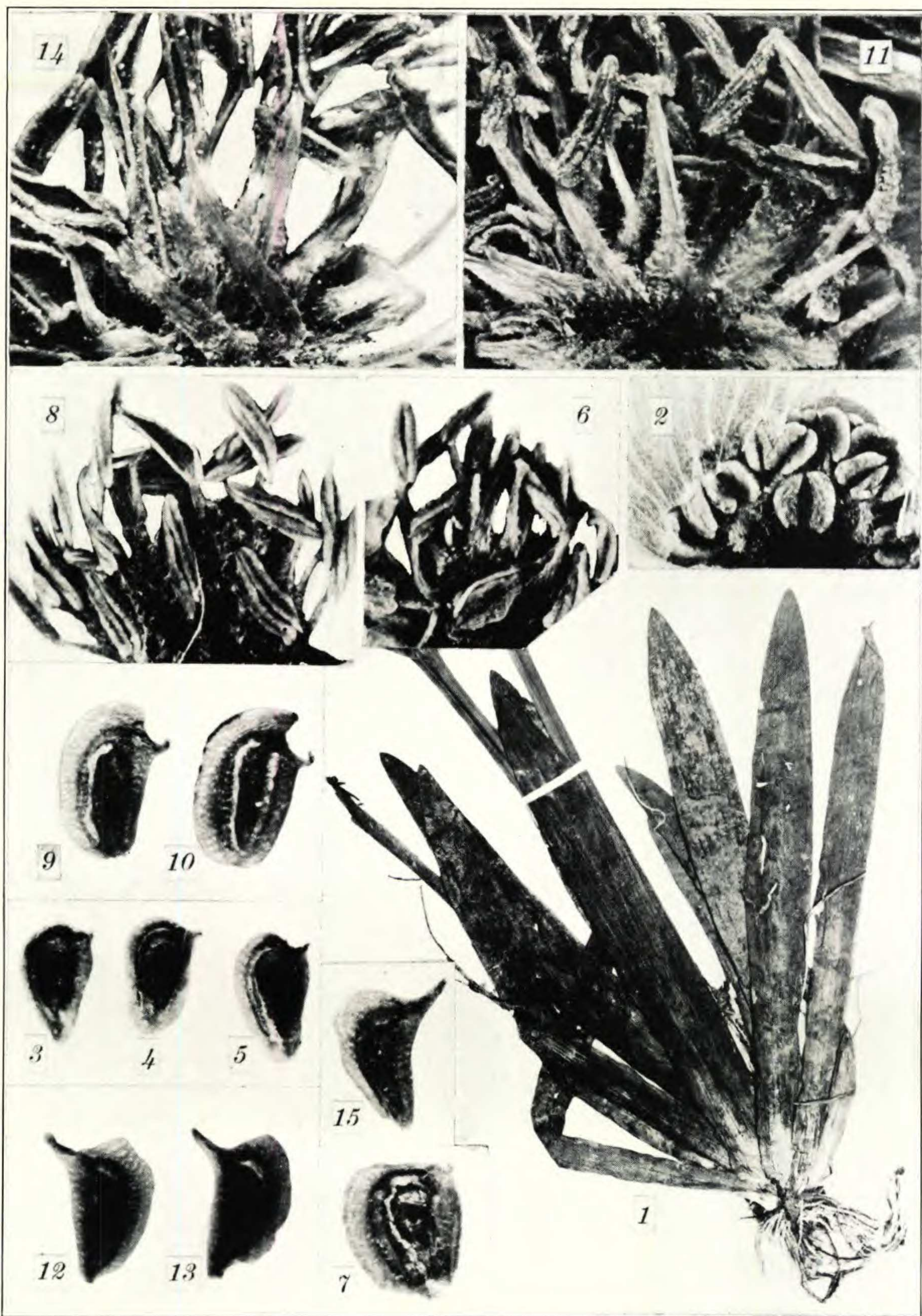


Photo. E. C. Ogden.

SAGITTARIA WEATHERBIANA: FIG. 1, phyllodia, $\times 5/12$.

S. GRAMINEA: FIG. 2, anthers, $\times 10$; FIGS. 3-5, achenes, $\times 10$.

S. AMBIGUA: FIG. 6, stamens, $\times 10$; FIG. 7, achene, $\times 10$.

S. CYCLOPTERA: FIG. 8, stamens, $\times 10$; FIGS. 9 and 10, achenes, $\times 10$.

S. LANCIFOLIA: FIG. 11, stamens, $\times 10$; FIGS. 12 and 13, achenes, $\times 10$.

S. FALCATA: FIG. 14, stamens, $\times 10$; FIG. 15, achene, $\times 10$.

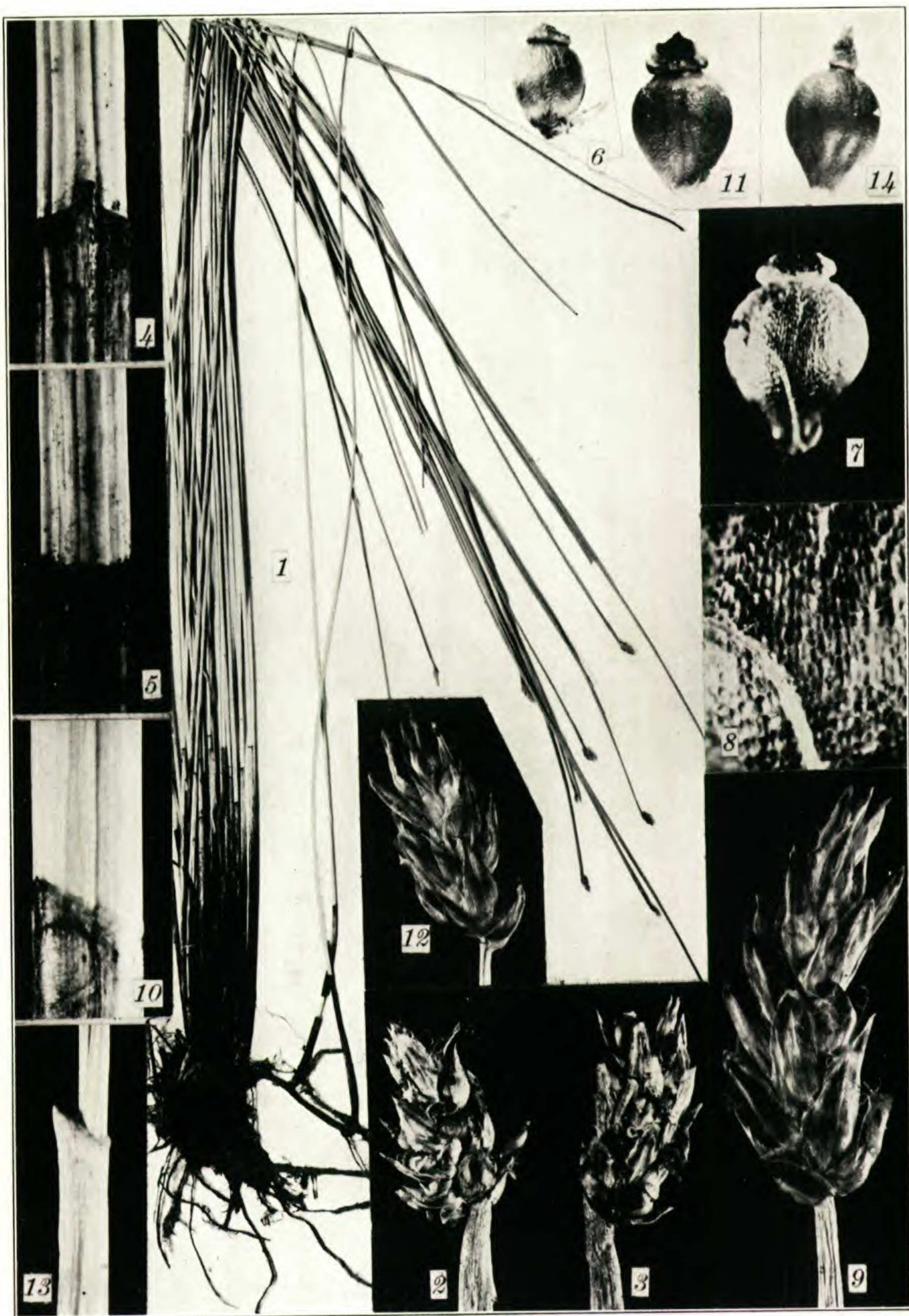


Photo. E. C. Ogden.

ELEOCHARIS AMBIGENS: FIG. 1, plant, $\times \frac{2}{5}$; FIGS. 2 and 3, spikelets, $\times 4$; FIGS. 4 and 5, summit of sheath, $\times 10$; FIG. 6, achene, $\times 10$; FIG. 7, achene, $\times 25$; FIG. 8, surface of achene, $\times 50$.

E. UNIGLUMIS: FIG. 9, spikelet, $\times 4$; FIG. 10, summit of sheath, $\times 10$; FIG. 11, achene, $\times 10$.

E. HALOPHILA: FIG. 12, spikelet, $\times 4$; FIG. 13, summit of sheath, $\times 10$; FIG. 14, achene, $\times 10$.

Its bracts and sepals are obtuse and strongly papillose; its pistillate pedicels are only 0.5–2.5 cm. long; its filaments (PLATE 386, FIG. 14) are slender and longer than the anthers; and its falcate achenes (PLATE 386, FIG. 15) are only 0.7–1 mm. wide and tapering to erect beaks. *S. falcata* is a late-flowering species of brackish to fresh river- and pond-borders and marshes. In southeastern Virginia, the Carolinas and Georgia it flowers from July to September. In Princess Anne County, the day (June 18) we collected the deep-green *S. Weatherbiana* with its achenes mostly fallen, the pale-leaved *S. falcata*, at the margins of Blackwater and North Landing Rivers, had not developed sufficiently to show young flower-buds.

PUCCINELLIA FASCICULATA (Torr.) Bickn. Upper border of salt marsh, Wachapreague, Accomac Co., no. 3629.

Apparently an extension southward from Delaware.

GLYCERIA SEPTENTRIONALIS Hitchc. Shallow water of swampy woods throughout, flowering in May (or earlier), essentially unrecognizable in mid-June: south of North Landing, no. 3630 and *F. & G.*, no. 4308; Little Creek, *F. & G.*, no. 4307; near Cornland, *F. & G.*, no. 4309.

The profusion of *Glyceria septentrionalis* in the coastal-plain swamps of southeasternmost Virginia and its absence northeast of Massachusetts, suggests that it is a subaustral, rather than a boreal species.

TRIPLASIS PURPUREA (Walt.) Chapm. Sand dunes, Cape Henry, *F. & G.*, no. 2712.

CALAMAGROSTIS CINNOIDES (Muhl.) Bart. Frequent from the northeastern corner of the Dismal Swamp across the Green Sea: wet peaty clearings in woods of *Pinus serotina*, south of Grassfield, no. 3647.

POLYPOGON MONSPELIENSIS (L.) Desf. Fresh to brackish or saline swales, pond-margins and shores, with strictly indigenous associates and looking as native as they: Wachapreague, no. 3643; outlet of Rainey's Pond, Sand Bridge, no. 3644, *F. G. & L.*, no. 4550; Cedar Island, *F. G. & L.*, no. 4551.

The statements of habitat, "Waste places" and "Moist waste places," in our current manuals are most unsatisfactory for the plant of the Virginia coast, although on the coast northward to New England the plant has every appearance of a casual introduction.

SPOROBOLUS POIRETHI R. & S. Roadsides, borders of fields and ditches, frequent: Little Creek, no. 3645; Knott's Island, no. 3646.

ARISTIDA OLIGANTHA Michx. Dry clay of open woods and thickets, north of Blackwater River, no. 3641.

A. LONGESPICA Poir. Dry open soil or open woods: north of Blackwater River, no. 3642; Cedar Hill, *F. & G.*, no. 2718.

LEPTOCHLOA FILIFORMIS (Lam.) Beauv. Border of brackish marsh near Kempsville, *F. & G.*, no. 2709.

SPARTINA CYNOSUROIDES (L.) Roth. Salt or brackish marshes, frequent: Kempsville, *F. & G.*, no. 2710.

GYMNOPOGON BREVIFOLIUS Trin. Occasional in Princess Anne Co.: border of ditch, Macon's Corner, *F. & G.*, no. 2708; damp sandy and peaty depressions back of dunes, Rifle Range, south of Rudy Inlet, no. 3650.

AXONOPUS FURCATUS (Flügge) Hitchc. Princess Anne Co.: damp sandy and peaty depressions back of the dunes, Rifle Range, south of Rudy Inlet, no. 3663; dry open clay lands and thickets, Virginia Beach, no. 3664.

PASPALUM LAEVE Michx., var. PILOSUM Scribn. (*P. longipilum* Nash). Pine woods near Macon's Corner, Princess Anne Co., *F. & G.*, no. 2730.

P. LAEVE, var. CIRCULARE (Nash) W. Stone (*P. circulare* Nash). Ditch by brackish marsh of North Landing River, Pungo Ferry, *F. & G.*, no. 2728.

P. SETACEUM Michx. Dry thicket near Cedar Hill, *F. & G.*, no. 2729.

P. SETACEUM Michx., var. SUPINUM (Bosc) Trin. (*P. supinum* Bosc). Wet peaty depressions in sandy pineland, The Desert, Cape Henry, no. 3659; sandy woods, northern end of Knott's Island, Princess Anne Co., no. 3660.

A slight extension northward, from North Carolina. *Paspalum supinum* Bosc, like *P. longepedunculatum* LeConte, is surely too confluent with *P. setaceum* for specific recognition. By treating them as definite species taxonomic values are debased and the clarity of true species, of which there is an abundance, is obscured. *P. longepedunculatum* should stand, it seems to me, as *P. setaceum*, var. *longepedunculatum* (LeConte) Wood.

P. CILIATIFOLIUM Michx. Wet, peaty clearings in woods of *Pinus serotina*, south of Grassfield, no. 3658.

PANICUM ANCEPS Michx., var. RHIZOMATUM (Hitchc. & Chase) Fern. (*P. rhizomatum* Hitchc. & Chase). Dry pinelands, Cape Henry, *F. & G.*, no. 2741.

P. AGROSTOIDES Spreng., var. CONDENSUM (Nash) Fern. (*P. condensum* Nash). Border of brackish marsh of North Landing River, Pungo Ferry, *F. & G.*, no. 2738.

P. ACICULARE Desv. Damp sands and peats or sandy woods, Princess Anne Co.: Cape Henry, no. 3693, *F. & G.*, no. 2748; Rifle Range, no. 3694; Sand Bridge, *F. G. & L.*, no. 4537.

P. ANGUSTIFOLIUM Ell. Dry or moist woods, common in Princess Anne Co.: Little Neck, no. 3695; Virginia Beach, no. 3697.

P. ROANOKENSE Ashe. Swales and damp sands, Rifle Range, south of Rudy Inlet, nos. 3667, 3668, 3675; boggy swale by Northwest River, Northwest, *F. G. & L.*, no. 4538.

P. LUCIDUM Ashe. Wet peaty clearings in woods of *Pinus serotina*, south of Grassfield, nos. 3670–3672; swampy or inundated woods, north of Blackwater River, no. 3673.

P. LANUGINOSUM Ell. Frequent in swampy woods and wet peat: north of Blackwater River, no. 3680; Princess Anne Courthouse, *F. & G.*, no. 2755.

P. LANUGINOSUM, var. *SEPTENTRIONALE* Fern. Swales back of the dunes, Rifle Range, south of Rudy Inlet, no. 3681.

P. VILLOSISSIMUM Nash. Occasional in Princess Anne Co.: damp sandy and peaty depressions back of the dunes, Rifle Range, no. 2699, *F. G. & L.*, no. 4543; dry mixed woods, Little Neck, no. 3700.

P. COMMONSIANUM Ashe, var. *ADDISONII* (Nash) W. Stone (*P. Addisonii* Nash). Damp sandy peats back of the dunes, Rifle Range, no. 3698; dry pine woods, Macon's Corner, Princess Anne Co., *F. & G.*, no. 2757.

P. COLUMBIANUM Scribn. Sandy borders of gum swamps in The Desert, Cape Henry, no. 3701.

P. SPHAEROCARPON Ell., var. *INFLATUM* (Scribn. & Sm.) Hitchc. Depressions in clay fields, Rosemont, no. 3676.

P. POLYANTHES Schultes. Frequent in peaty and sandy woods, thickets and clearings, both counties: south of Grassfield, no. 3677.

P. ENSIFOLIUM Baldw. Damp sandy and peaty depressions back of the dunes, Rifle Range, south of Rudy Inlet, nos. 3682, 3683, *F. G. & L.*, no. 4539.

P. BOSCHII Poir., var. *MOLLE* (Vasey) Hitchc. & Chase. Dry, mixed woods, Little Neck, no. 3689.

TRIPSACUM DACTYLOIDES L. Frequent and conspicuous in dry fields and on roadsides, Princess Anne Co.: Munden, no. 3666.

CYPERUS RIVULARIS Kunth. Brackish marsh of North Landing River, Pungo Ferry, *F. & G.*, no. 2796.

C. SABULOSUS Mart. & Schrad. Frequent in damp soils, Princess Anne Co.: Kempsville, *F. & G.*, no. 2782; Rosemont, no. 3712; outlet of Rainey's Pond, no. 3713; Knott's Island, no. 3711.

C. COMPRESSUS L. Occasional: sandy roadside, North Landing, *F. & G.*, no. 2794; depressions in clay field, Rosemont, no. 3708; sandy woods, Knott's Island, no. 3707.

C. DIFFORMIS L. VIRGINIA: in clay of marsh bordering Owl Creek, Virginia Beach, no. 3710.

Cyperus difformis is a species of wide dispersal in the Old World tropics of Asia, Africa, Australia and the Pacific Islands. In America it seems not to have been noted except in Mexico, where it is local, and in California, where it has recently appeared in rice-fields. It abounds in the clay ditches south of the small brackish pond of Owl Creek, growing in company with the typical plants of such a habitat, where it might be indigenous or with equal probability a recent introduction. It may be another of the recent introductions into our

flora from the warm Far East, like *Cyperus Iria*, *C. amuricus* Max.¹ and *Polygonum caespitosum* Blume, var. *longisetum* (De Bruyn) A. N. Steward.² It is most probable that these oriental weeds have come in in rice-straw used as packing.

C. HASPAN L. Local: inundated swales back of the dunes, south of False Cape, no. 3733.

C. HALEI Torr. Silts near outlet of Rainey's Pond, Sand Bridge, no. 3719.

First north of Florida; leaf-margins very harsh.

C. LANCASTRIENSIS Porter. Border of woods and in ditches, Little Neck, nos. 3735 and 3736.

C. RETROFRACTUS (L.) Torr. Dry pinelands, Cape Henry, no. 3734, *F. & G.*, no. 2787.

KYLLINGA PUMILA Michx. Frequent in Princess Anne Co.: wet peaty depressions in sandy pineland, The Desert, Cape Henry, no. 3741; damp sand and clay back of the ponds, Dam Neck, no. 3742.

ELEOCHARIS QUADRANGULATA. In 1905 I pointed out³ that the very distinct species with sharply quadrangular culms, *Eleocharis quadrangulata* (Michx.) R. & S., Syst. ii. 155 (1817), is quite unlike the tropical *E. mutata* (L.) R. & S., with which it had been confused. At that time I was familiar with *E. quadrangulata* chiefly at its northeasternmost station, Lake Waban at Wellesley, Massachusetts. Mr. Long and I saw *E. quadrangulata* several times in Princess Anne County and twice collected it and he, Mr. Griscom and I, in 1935, saw it in abundance and made one collection. Our material and all other from Princess Anne County and all I have seen from South Carolina, North Carolina, Delaware, and Cape May, New Jersey, agrees in being more slender and averaging smaller in all parts than the plant of the northern and inland states; but material from Savannah, Georgia is like the northern and inland plant. In the more slender plant the purple upper sheath at the base of the culm is tubular to within 10 to 5 mm. of the tip and it tardily ruptures. In the coarser plant the free tip is usually 4-6 cm. long, sometimes 8 cm., and the sheath so promptly ruptures that the free tip appears even longer.

Scirpus quadrangulatus Michx. Fl. Bor.-Am. i. 30 (1803), the type of *Eleocharis quadrangulata*, came from South Carolina and a photograph of the type most kindly sent by Professor Humbert of the Muséum National d'Histoire Naturelle at Paris and another sent by

¹ See Fern. & Grisc. RHODORA, xxxvii. 148 (1935).

² See Blake, RHODORA, xxxiv. 146, 147 (1932).

³ RHODORA, xxvii. 38, t. 149, figs. 1-4 (1905).

Rev. Hugh O'Neill of the Catholic University of America show it to be the slender extreme of the southern coastal plain. I am accordingly differentiating two varieties, as follows:

ELEOCHARIS QUADRANGULATA (Michx.) R. & S., var. **typica**. *Scirpus quadrangulatus* Michx. Fl. Bor.-Am. i. 30 (1803). *E. quadrangulata* (Michx.) R. & S. Syst. ii. 155 (1817). Culms 3–9 dm. high, 1.5–4 mm. thick; upper basal sheath with free tip 0.5–1 cm. long; spikelet 1.5–4 cm. long; achenes 2–2.5 mm. long, 1.4–1.8 mm. broad.—Pools of coastal plain, South Carolina to Cape May, New Jersey.

Var. **crassior**, var. nov., culmis 6–12 dm. altis, 3–5.5 mm. crassis; apice libero vaginae 1.5–8 cm. longo; spiculis ad 6 cm. longis; achaeniis 2.2–3 mm. longis 1.6–2 mm. latis.—Georgia to Texas, locally north to Massachusetts, Connecticut, New York, southern Ontario, Michigan, Wisconsin, Missouri and Oklahoma. TYPE: in 3–8 dm. of water, Waban Lake, Wellesley, Massachusetts, October 3, 1908, *Fernald & Wiegand* in Pl. Exsicc. Gray. no. 133 (in Gray Herb.).

It is most probable that var. *crassior* is *Scirpus marginatus* Muhl., Gram. 28 (1817), which, on account of the earlier *S. marginatus* Thunb., was renamed *S. albomarginatus* R. & S. Mant. ii. 74 (1824). No material of Muhlenberg's plant can be found at Philadelphia; consequently a new type is selected for the coarse variety, for which the name assigned by Roemer & Schultes would be inappropriate.

E. ROSTELLATA Torr. Brackish marsh, Lynnhaven, no. 3760.

E. ALBIDA Torr. Local: inundated swales back of the dunes, south of False Cape, no. 3767, *F. G. & L.*, no. 4565.

E. LINDHEIMERI (Clarke) Svenson, RHODORA, xxxi. 199 (1929). Forming dense turf on open wet sand bordering an inundated swale back of the dunes, south of False Cape, Princess Anne Co., no. 3772, also *F. G. & L.*, no. 4572.

The first collection on the coastal plain from east of Texas and Oklahoma. Our material is quite like the type collection (*Lindheimer*, no. 315) but a little stouter. On the wet sand near False Cape (on the Back Bay side) it forms a dense green carpet, like a lawn, promptly distinguished from the taller and ubiquitous *E. flaccida* (Reichenb.) Urban by its spongy culms only up to 8 cm. high, its few-flowered flat spikelets, with narrow herbaceous and strongly striate scales, and its longitudinally ridged and trabeculate achenes.

E. MICROCARPA Torr. Wet peaty depressions in sandy pineland, The Desert, Cape Henry, no. 3761.

Quite typical, an extension north from South Carolina, though the only slightly different var. *fili culmis* Torr. (*E. Torreyana* Boeckl.), which is stiffer and with chestnut-brown and firmer scales, extends northward locally to eastern Connecticut. The futility of trying to

keep *E. Torreyana* apart as a species is well shown by the treatment in Small's Manual. In the key, on page 160, *E. microcarpa* is given a whole call by itself: "Scape capillary: achene-body 0.5 mm. long," while *E. Torreyana* comes under "Scape filiform: achene-body over 0.5 mm. long," with a further division indicating that the achenes are "nearly 1 mm. long." The distinction between "capillary" and "filiform" is a bit erudite for a key, and in Small's fuller description of *E. microcarpa* (p. 164) the achenes have shown some instability, becoming "0.5 mm. long or a little longer." That is what they do in Nature. After comparing many of them I have given up trying to separate as species *E. Torreyana* from *E. microcarpa*. When Torrey first called attention to the two tendencies, he did not consider them separate species and even doubted whether they were varietally separable and he did not consider that capillary and filiform culms were fundamentally different. *E. microcarpa*, based on material from New Orleans, was fully described, with capillary culms 6–8 inches long; spikelets ("spikes") nearly 2 lines long; scales with "sides brownish-red"; and "Nut scarcely one-third of a line [0.7 mm.] long." His β . ? *filiculmis*, from New Jersey, had "Culms . . . capillary or filiform, . . . wiry, 3–4 inches high. Spikes more than two lines long. Scales dark chestnut-coloured." Torrey noted a slight difference in the shape of the achene (nut) in his specimens but it is one which quickly disappears upon examination of a large series of the two extremes. *E. Torreyana* Boeckeler was merely Torrey's unfortunately named *E. microcarpa*, var. ? *filiculmis* raised without indication of new characters to specific rank.

ELEOCHARIS ambigens, sp. nov. (TAB. 387, FIGS. 1–8), laxe stolonifera, rhizomate stolonibusque firmis purpureo-castaneis 1.5–2 mm. crassis; culmis subrigidis pallidis 2.5–6 dm. altis 0.8–1.5 mm. crassis in caespitibus parvis; vaginis artis basi purpurascentibus vel castaneis ad apicem oblique subtruncatis coriaceis; spicula lanceolata vel anguste ovoidea 4–9 mm. longa 2–3.5 mm. crassa, laxe pauciflora; squama inferiora spathiformi late ovata subcoriacea stramineo-grisea basi plerumque valde prolongata; squamis fertilis lanceolato-ovatis acutis vel subacutis pallide brunneis margine albido-hyalinis, imis mediisque 2–3 mm. longis; setis 2–3 brevissimis vel nullis; achaeniis ellipsoideo-obovoideis biconvexis stramineis deinde subcastaneis 1.2–1.7 mm. longis 1 mm. latis minute reticulatis; tuberculo depresso-deltaideo apiculato 0.2–0.5 mm. alto 0.5–0.7 mm. lato.—Pond-margins and marshes, Elizabeth Islands, Massachusetts to southeastern Virginia. MASSACHUSETTS: peaty margin of Sheep Pond, Cuttyhunk, August 11, 1927, *Fogg*, no. 2526. RHODE ISLAND: damp sandy shore of Wash Pond, Block Island, August 22, 1913,

Fernald, Hunnewell & Long, no. 8887. NEW JERSEY: toward the beach, Cape May Point, July 17, 1906, *S. S. Van Pelt*; Race Course Pond, Cape May Co., June 12, 1911, *O. H. Brown*; edge of salt marsh, Cape May, July 4, 1929, *Svenson*, no. 3162. VIRGINIA: marshes bordering ponds, Dam Neck, Princess Anne Co., July 30, 1934, *Fernald & Long*, no. 3765 (TYPE in Gray Herb.); same station, June 16, 1935, *Fernald, Griscom & Long*, no. 4567; swale bordering Muddy Creek, Princess Anne Co., June 19, 1935, *Fernald, Griscom & Long*, no. 4569; swales and pond-margin, outlet of Rainey's Pond, June 19, 1935, *Fernald, Griscom & Long*, no. 4570; swales back of the dunes, Sand Bridge, June 19, 1935, *Fernald, Griscom & Long*, no. 4571; boggy swale by Northwest River, near Northwest, June 18, 1935, *Fernald, Griscom & Long*, no. 4568.

Eleocharis ambigens has been distributed sometimes as *E. palustris* (L.) R. & S., sometimes as *E. Smallii* Britton, again as *E. uniglumis* (Link) Schultes. It is the puzzling form which influenced the late Miss Brackett and me to treat as a variety of *E. uniglumis* the plant of saline and brackish shores from the Gulf of St. Lawrence to Virginia, *E. uniglumis* var. *halophila* Fern. & Brackett, RHODORA, xxxi. 72, t. 183 (1929). All three species, *E. palustris*, *E. Smallii* and *E. uniglumis* (FIG. 9–11) have the sheaths herbaceous at the oblique summit and the achenes smooth or only obscurely pebbled; and the first two have 2 or 3 narrow basal scales. The spathiform single basal scale of *E. ambigens* allies it with *E. uniglumis*, but that boreal species (reaching its southern limit in eastern America on the mountains of Newfoundland) has a broader tubercle (FIG. 11) 0.6–1 mm. broad, its spikelets are usually twice as large and with purple to castaneous firm scales (FIG. 9), and its achene is not definitely reticulated.

With *Eleocharis ambigens* now cleared from the boreal *E. uniglumis*, the troublesome series which was thought to connect the latter with its var. *halophila* disappears and the latter stands out as the clearly marked species which Miss Brackett and I were considering it until the Block Island and Cape May plants came to our attention. Many specimens were labeled and distributed by us as *E. halophila* and that binomial can now be revived:

E. halophila (Fernald & Brackett) Fernald & Brackett in herb. *E. uniglumis*, var. *halophila* Fernald & Brackett, RHODORA, xxxi. 72, t. 183 (1929). FIGS. 12–14.

Eleocharis ambigens differs from *E. halophila* in the cartilaginous orifice of the sheath, paler, thinner and shorter scales (the reddish to castaneous firm and lustrous scales of *E. halophila* 3–5 mm. long).

more broadly obovoid or pyriform reticulate achene with lower and broader tubercle, the slender-conical to lanceolate tubercle of *E. halophila* being only 0.2–0.5 mm. broad at the bulbiform base. For comparison a sheath-orifice (FIG. 13), a spikelet (FIG. 12) and an achene (FIG. 14) from the type of *E. halophila* are shown in PLATE 387. The range of *E. HALOPHILA* was extended southward from Delaware by its discovery in VIRGINIA: wet sandy depressions, False Cape, June 20, 1935, *Fernald, Griscom & Long*, no. 4566.

E. SIMPLEX (Ell.) A. Dietr. Apparently now local: swampy and inundated woods, north of Blackwater River, no. 3764.

E. TUBERCULOSA (Michx.) R. & S. Common in damp peaty swales and depressions throughout the area; the following collected: south of Grassfield, no. 3762; Rifle Range, south of Rudy Inlet, no. 3763.

DICHROMENA COLORATA (L.) Hitchc. Local: inundated swales back of the dunes, south of False Cape, no. 3740, also *F. G. & L.*, no. 4573.

FIMBRISTYLIS PUBERULA (Michx.) Vahl, forma **pycnostachya**, f. nov. (TAB. 388, FIG. 3), spiculis valde confertis dense glomerulatis. TYPE: damp sandy flats back of the dunes, Rifle Range, south of Rudy Inlet, Princess Anne Co., Virginia, July 30, 1934, *Fernald & Long*, no. 3752 (in Gray Herb.). Also collected in inundated swales back of the dunes, south of False Cape, Princess Anne Co., no. 3753; and examined from Missouri and Oklahoma.

F. PUBERULA, forma **eucycla**, f. nov. (TAB. 388, FIG. 2), spiculis pedicellatis, obovoideis vel obovoideo-ellipsoideis apice valde rotundatis vel subtruncato-rotundatis. TYPE: swales back of the dunes, Rifle Range, south of Rudy Inlet, Princess Anne Co., Virginia, July 31, 1934, *Fernald & Long*, no. 3750 (in Gray Herb.). Also from the same locality, nos. 3747, 3748; and examined from Georgia (Tybee Island, *Harper*, no. 738; Cumberland Island, *Harper* no. 1544).

Typical *Fimbristylis puberula* (PLATE 388, FIGS. 1 and 4), as I understand it, has the spikelets narrowed at summit, either obtuse or subacute. It is of wide range, northward near the coast to Long Island and inland in the Mississippi drainage to Indiana, Illinois, Nebraska and Colorado. Some of the material of the interior has been separated as *F. interior* Britton, Ill. Fl. ed. 2, i. 320, fig. 785 (1913), because it has "Scales glabrous," whereas *F. puberula* was defined by Dr. Britton as having "Scales, at least the lower, pubescent or puberulent." *F. interior* was given a range from "Colorado and Nebraska to Texas." There are before me several sheets from Colorado, Nebraska and Kansas (as well as many from Oklahoma). The 3 sheets from Colorado all show, with a lens $\times 8$, puberulent lower scales; the 2 from Kansas likewise show them, and 1 from



Photo. E. C. Ogden.

FIMBRISTYLIS PUBERULA: FIG. 4, umbel, $\times 1$.
F. PUBERULA, forma EUCYCLA: FIGS. 1 and 2, plant, $\times 1$.
F. PUBERULA, forma PYCNOSTACHYA: FIG. 3, umbel (glomerule), $\times 1$.

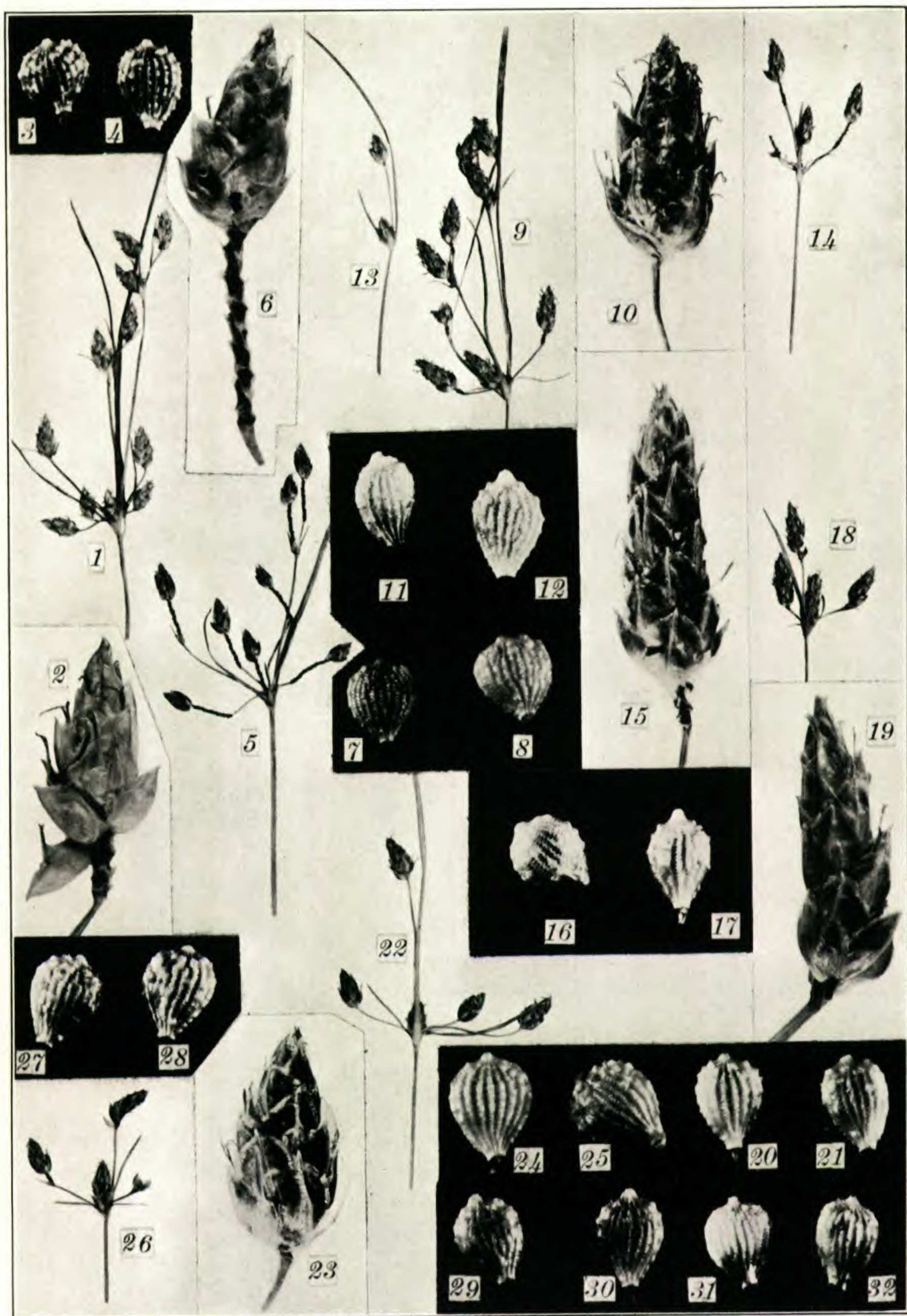


Photo. E. C. Ogden.

FIMBRISTYLIS BALDWINIANA: inflorescences, $\times 1$; spikelets, $\times 5$; achenes, $\times 10$.

Nebraska has them puberulent, another apparently not. Conversely, along the Atlantic coast the puberulence is often most evasive and seen only on the very youngest spikelets, if at all; consequently, in sending out the collections of L. F. and Fannie R. Randolph from North Carolina, the specimens which were young enough to show some puberulence were called *F. puberula* (Randolph & Randolph, no. 1024), those which were older were called *F. interior* (R. & R. no. 540).

Fimbristylis puberula, when lacking the puberulence, can best be told from *F. castanea* (Michx.) Vahl (the *F. spadicea* of continental American authors), by growing in small soft tufts, with thin and soft leaf-sheaths and (when properly collected) showing slender rhizomes and stolons, which in hard soil are not often collected. *F. castanea* forms dense tussocks, has dark coriaceous sheaths and is nonstoloniferous.

F. CASTANEA (Michx.) Vahl. Forming dense tussocks at borders of salt or brackish marshes: Wachapreague, Accomac Co., no. 3743; Lynnhaven, no. 3744.

FIMBRISTYLIS BALDWINIANA (Schultes) Torr. (PLATE 389). The plant of southeastern Virginia is quite typical, but in studying it I have taken the opportunity to compare it with the recently proposed *F. Darlingtoniana* Pennell, *Bartonia*, xv. 30 (1933). The two, as maintained by Pennell, differ as follows:

- | | |
|---|-----------------------------|
| Achene pale yellow, finely and sharply striate-sulcate, about 1 mm. long; scales pale brown, green-ridged, dull or slightly shining, as wide as long, acute or slightly mucronulate, slightly bowed, wholly appressed; spikelets several, on the widely spreading rays of the simple or once-compound umbel; stem usually 2–3.5 dm. tall. | 1. <i>F. baldwiniana</i> |
| Achene silvery white, striate or slightly sulcate, slightly more turgid, about 1.25 mm. long; scales dark brown, green-ridged, lustrous, strongly bowed and with tips loosely ascending; spikelets 1 to 6, on the ascending rays of the nearly always simple umbel; stem usually 0.5–2.0 dm. tall. | 2. <i>F. darlingtoniana</i> |

Fimbristylis Baldwiniana is maintained, rightly, for the plant of the Atlantic coastal plain, from Maryland to Florida and Texas. *F. Darlingtoniana* is supposed to be confined to "Serpentine Barrens of southeastern Pennsylvania, northeastern Delaware, and doubtless in adjacent Maryland." As illustrated by Pennell (his fig. 1) the achenes are quite different. In studying the material in the Gray Herbarium, including 11 sheets of *F. Darlingtoniana* from the serpentines of southeastern Pennsylvania and adjacent Delaware (two of them fine sheets from William Darlington himself) I find myself puzzled to keep this plant apart as a species. As a geographic variety it is

hardly separable, too many plants of the southern sands and granitic gravels having castaneous scales (FIGS. 18, 19, 22, 23), several of them having quite as large (FIGS. 24, 25) and as pale achenes; and in southeastern material, although the usually smaller and grayer achenes are commonly rougher, it is not unusual to find them embarrassingly smoothish (FIGS. 8, 24, 31), while quite roughened achenes are frequent in the material of *F. Darlingtoniana* (FIGS. 12, 17, 30).

As to the "several spikelets" on "widely spreading rays" of the umbel in *F. Baldwiniana*, as opposed to the only 1-6 spikelets "on the ascending rays" in *F. Darlingtoniana*, it is easy to find plants of the South with only 1-6 spikelets (Hyattsville, Maryland, September 30, 1912, *Holm*; Bedford Co., Virginia, September 4, 1871, *A. H. Curtiss*; North Landing, Norfolk Co., Virginia, *Fernald & Griscom*, no. 2772; Rosemont, Princess Anne Co., Virginia, *Fernald & Long*, no. 3756 (FIG. 13); Burke Co., North Carolina, *M. A. Curtis*; Leslie, Georgia, *Harper*, no. 405; Athens, Georgia, *Harper*, no. 68 (FIG. 22); Rock Hill, Florida, *Harper*, no. 92; etc.). Conversely, one of the Darlington sheets from West Chester, Pennsylvania has as many as 10 spikelets, while *Pennell's* from Williamson School (FIG. 9) has 9 and the rays are as widely divergent as in much southern material. In order to check the characters reputed to separate two species I have asked Mr. Ogden to reproduce the inflorescences and the details of several specimens. These are shown in PLATE 389. I am unable to sort these photographs into two piles representing different species.

FIMBRISTYLIS AUTUMNALIS (L.) R. & S., var. **mucronulata** (Michx.), comb. nov. *Scirpus mucronulatus* Michx. Fl. Bor.-Am. i. 31 (1803). *F. mucronulata* (Michx.) Blake, RHODORA, xx. 25 (1918).

Blake showed in 1918 that the type of *Scirpus autumnalis* L., upon which *Fimbristylis autumnalis* rests, is the plant with lance-ovoid spikelets in comparatively little-branched inflorescences, which was described in 1855 as *F. Frankii* Steud. Syn. Pl. Cyp. 111 (1855) and for which the name *F. geminata* Kunth (1837) is in current use; while the extreme with more slender spikelets in often more compound inflorescences is *F. mucronulata* (Michx.) Blake, based on *Scirpus mucronulatus* Michaux, which came from the Carolinas. In their extremes the two are easily distinguished, but so many transitions occur (in shape and size of spikelet, color of scales, size and roughening of achenes and degree of branching) that I am at a loss to see anything but two strong divergencies of one specific type. Those to whom tendencies are equivalent to species will maintain them as specifically

distinct. The identifications, as they come to the Gray Herbarium, indicate that no one has yet succeeded in stating differences between them which others can clearly interpret.

SCIRPUS OLNEYI Gray. Abundant in saline or brackish marshes and even in fresh river-marshes, Princess Anne Co.: Lynnhaven, no. 3777; Blackwater River (fresh), *F. G. & L.*, no. 4574.

RYNCHOSPORA CORNICULATA (Lam.) Gray. Local: in clay at border of swamp, Rosemont, no. 3784.

R. GRACILENTA Gray. Local in Norfolk Co.: wet, peaty clearings in woods of *Pinus serotina*, south of Grassfield, no. 3792.

RYNCHOSPORA GRACILENTA Gray, var. ***diversifolia***, var. nov. (TAB. 390, FIGS. 4-7), quam forma typica crassiore firmioreque ad 1 m. alto; foliis caulinis planis 1.5-2.5 mm. latis; cymis corymbiformibus terminalibus 1-1.5 cm. latis; spiculis 4-5.5 mm. longis; achaeniis 1.6-2 mm. longis, tuberculo 1.5-2.5 mm. longo.—Peats and wet sands of the Coastal Plain from Louisiana to Florida, north very locally to southern New Jersey. TYPE: swales back of the dunes, Rifle Range, south of Rudy Inlet, Virginia, July 31, 1934, *Fernald & Long*, no. 3796, in Gray Herb.

Typical *Rynchospora gracilenta*, very characteristic in its type-locality, the Pine Barrens of New Jersey, has the leaves all capillary or the cauline at most linear-involute and up to 1 mm. broad, the terminal cymes only 3-10 mm. broad, the spikelets 3-4 mm. long, achenes 1.2-1.5 mm. long and tubercle 0.8-1.4 mm. long. Its details are shown in FIGS. 1-3. Var. *diversifolia* has the leaves of the basal tufts capillary as in the typical form of the plant, but is quickly distinguished from it by its stiffer habit, broadish cauline leaves, and longer spikelets, fruits and tubercles. Several collections from Louisiana, Florida and Georgia belong to it and at least one from New Jersey: Quaker Bridge, August 18, 1866, *Diffenbaugh*.

Typical slender-leaved *Rynchospora gracilenta* was collected in wet, peaty clearings in woods of *Pinus serotina*, south of Grassfield, Norfolk Co., no. 3792.

RYNCHOSPORA GLOMERATA (L.) Vahl. In 1918 Dr. S. F. Blake showed¹ that typical *R. glomerata* is the coarse southern plant which had been called *R. glomerata*, var. *paniculata* (Gray) Chapm., while the somewhat smaller plant, which extends northward to Nova Scotia, New Brunswick, New England, northern New York, southern Ontario and Wisconsin, he identified with *R. capitellata* (Michx.) Vahl. Dr. Blake clearly established, through typical specimens sent to European herbaria, the identity of the coarse southern plant; the

¹Blake, RHODORA, xx. 25-28 (1918).

identity of the smaller northward-ranging plant was less finally settled. At that time Blake was quite satisfied that the two were distinct species, saying: "The more northern plant, which has passed as true *glomerata*, has an achene 1.5 mm. long (including the crustaceous 'perianth'-base, but excluding the style) and 0.8 mm. wide, while in the more southern var. *paniculata* the achene is 2 by 1.5 mm. and much more umbonate. In the southern plant, moreover, the spikelet is usually 1-fruited, in the northern plant 2-3-fruited, as long ago noted by Kunth (Enum. ii. 296 (1837)) in describing the southern form as *R. glomerata* var. *robustior*. This difference in size and shape of achenes, which runs with great constancy through a series of more than 115 collections of the two plants, in combination with other differences in size of plant, breadth of leaf, looseness of inflorescence, and number of achenes in the spikelet fully confirms the specific distinctness of the two plants."

Nevertheless, although the more northern plant can hardly be confused with the largest extreme of the more southern, two trips to southeastern Virginia where both grow, first in September, 1933 with Mr. Ludlow Griscom, then with Mr. Bayard Long in late July and early August, 1934, have led me to a close study of the group with the hope of finding the clear differentiations emphasized by Blake but not satisfactorily evident in the field. As a result of this study I am forced to the decision that Asa Gray's later treatment of *R. glomerata* as a variable species, including both the northern and the southern extremes, was better justified than his earlier and less experienced judgment, that the latter were distinct species.

From inflorescences of the largest and most branching of true *Rynchospora glomerata* I get achenes with variation in size much greater than found by Blake: a range of 1.7-2 mm. in length and of 0.8-1.5 mm. in breadth. In fact, I take the extreme breadth, 1.5 mm., from Blake's statement; I have measured none exceeding 1.4 mm. The tubercle in this large southern extreme varies from 1-1.8 mm. long. As to the 1-flowered spikelets, ordinarily they are so; but it is not difficult to find them with 2 flowers, for instance in an Arkansas specimen (Grand Prairie, *Harvey*, no. 13) which Blake has specially annotated as *R. glomerata*. It, like several other sheets of the latter, exhibits 2-flowered as well as 1-flowered spikelets.

In the northern plant, *Rynchospora capitellata* of Blake's treatment, I have taken achenes from the most northeastern material, from Nova Scotia, New Brunswick and New England. I find it difficult

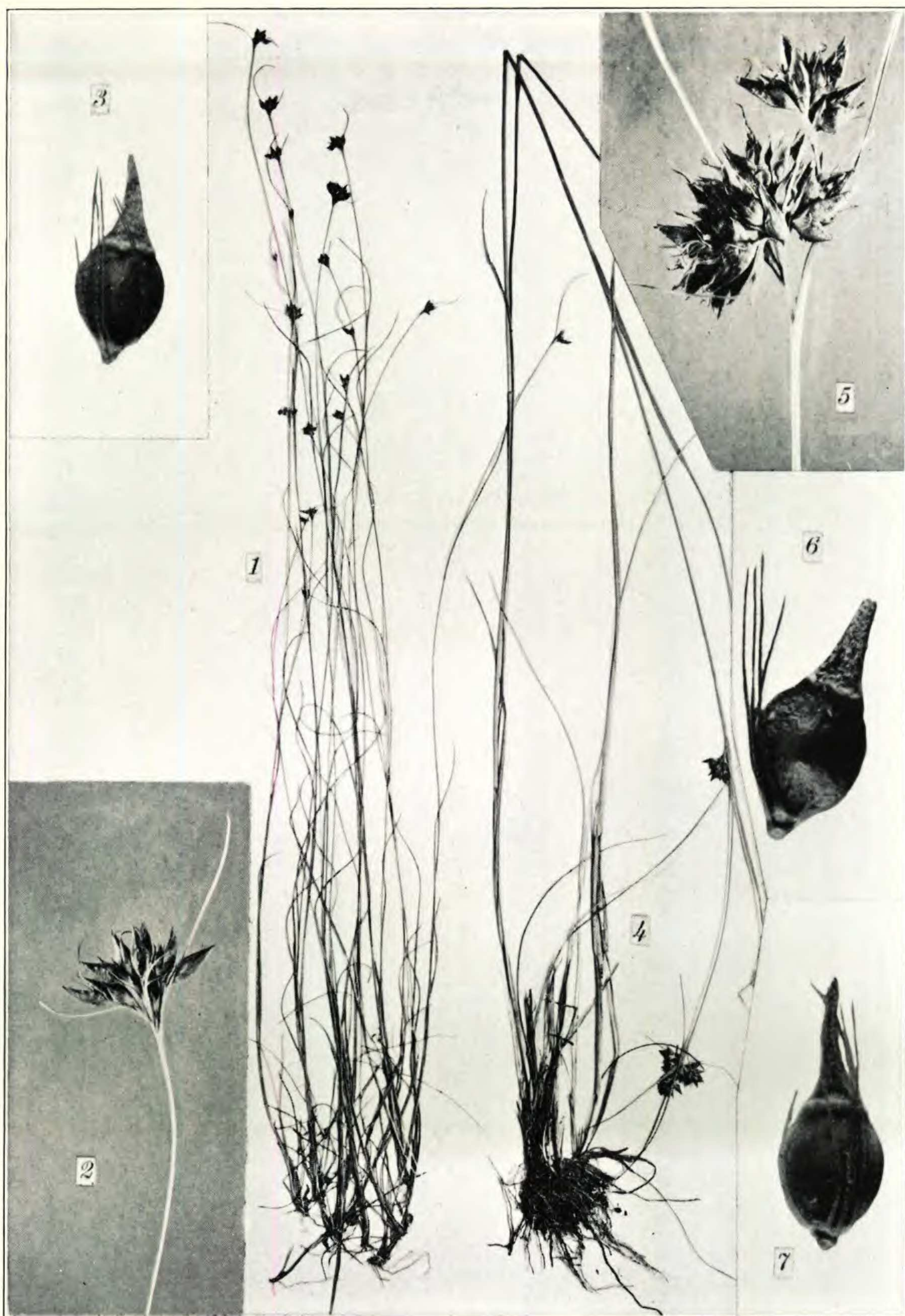


Photo. E. C. Ogden.

RYNCHOSPORA GRACILENTA: FIG. 1, plant, $\times \frac{2}{5}$; FIG. 2, inflorescence, $\times 2$; FIG. 3, achene, $\times 10$.

R. GRACILENTA, var. DIVERSIFOLIA: FIG. 4, plant, $\times \frac{2}{5}$ (TYPE); FIG. 5, inflorescence, $\times 2$; FIGS. 6 and 7, achenes, $\times 10$.

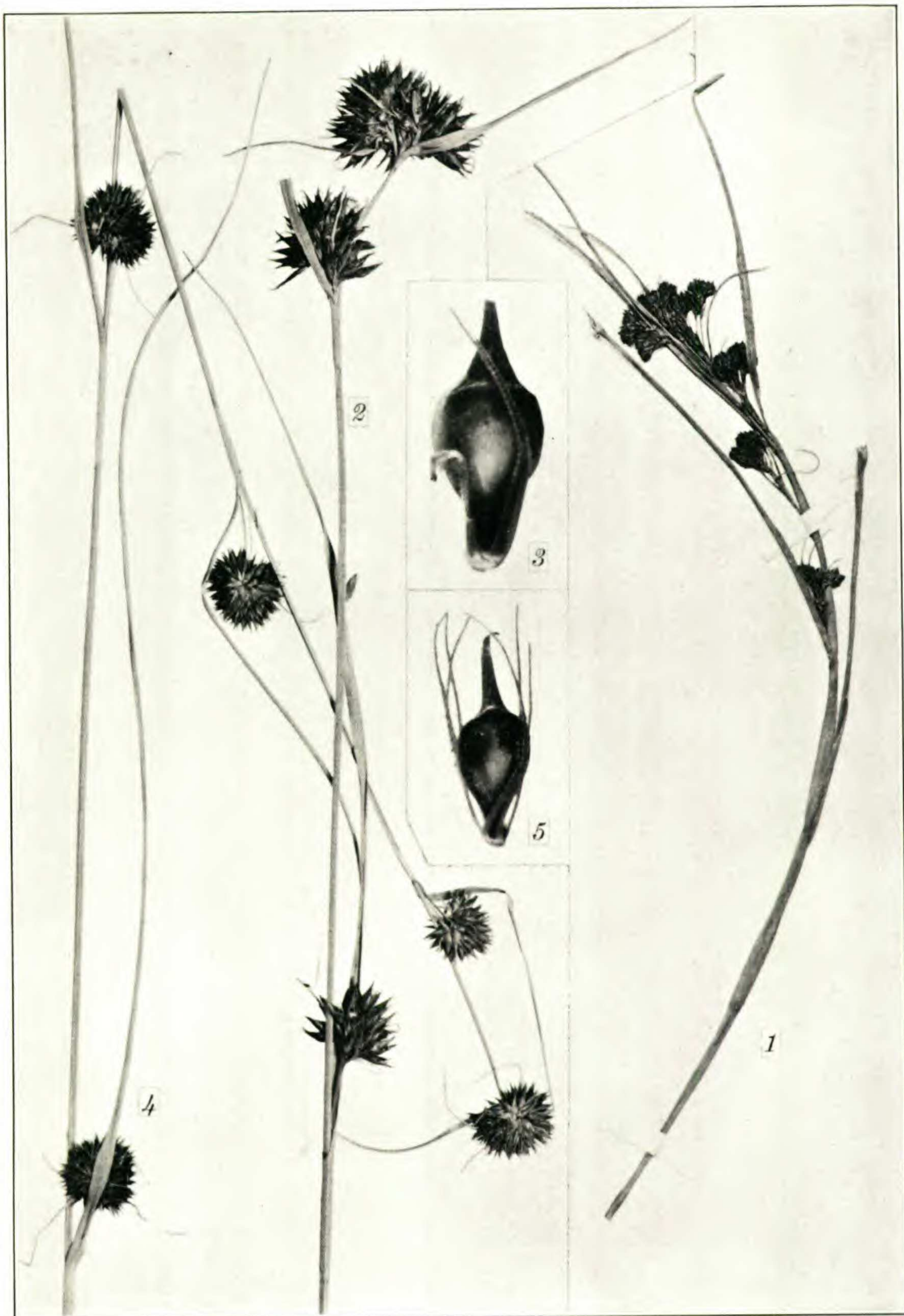


Photo. E. C. Ogden.

RYNCHOSPORA AXILLARIS: FIG. 1, TYPE, $\times \frac{3}{4}$, from photograph supplied by Professor H. HUMBERT.

R. CEPHALANTHA: FIG. 2, inflorescence, $\times 1$; FIG. 3, achene, $\times 10$.

R. MICROCEPHALA: FIG. 4, inflorescence, $\times 1$; FIG. 5, achene, $\times 10$.

to get any to meet the stated specifications: 1.5 mm. long, 0.8 mm. wide. Instead, I find a variation of 1.5–1.8 mm. in length, of 0.8–1.2 mm. in breadth; while the tubercle ranges from 0.8–1.2 mm. long.

These measurements, it will be noted, all overlap. As a result I find it impossible, without further illumination, to retain *Rynchospora capitellata* as a good species. Its first available varietal name is *R. glomerata*, var. *minor* Britton, Trans. N. Y. Acad. Sci. xi. 87 (1892). At the same time (p. 88) Britton published *R. glomerata*, var. *leptocarpa* Chapm. for a plant of the southern Coastal Plain. The slight difference in the shape of the achene, the remote and few axillary cymes and the narrow leaves of the latter all appear sporadically in the North, but for the main series of the latter area the name var. *minor* is without question. Var. *leptocarpa*, although it seems to me unworthy special recognition, is maintained by Blake; and Small elevates it to specific rank, as *R. leptocarpa* (Chapm.) Small, Man. 181, 1503 (1933).

Throughout the genus the direction of the barbs or serratures on the bristles is very fickle, as it is in *Eleocharis* and *Scirpus*. From the same areas one can get retrorsely or upwardly barbed bristles or even those which are perfectly smooth. Such divergencies from the ordinary are most interesting but they do not constitute true varieties (as I use the term). As forms they are adequately and more satisfactorily covered. My own interpretation of *Rynchospora glomerata* is covered by the following key.

- a. Culms stoutish, 0.5–2 m. high; leaves 3–7 mm. broad; inflorescence 0.3–1 m. long, its axillary peduncles freely forked; spikelets 5–6 mm. long, most often 1 (sometimes 2)-flowered; achenes 1.7–2 mm. long, 0.8–1.5 mm. broad; tubercle 1–1.8 mm. long. Var. *typica*.
- a. Culms rather slender, 0.1–1.5 m. high; leaves 0.5–4 mm. broad; inflorescence 0.2–6 dm. long, its axillary peduncles less forked or simple; spikelets 3–5 mm. long, usually 2–3-flowered; achenes 1.5–1.8 mm. long, 0.8–1.2 mm. broad; tubercle 0.8–1.2 mm. long. b.
- b. Bristles serrulate or barbed.
 - Bristles retrorsely barbed. Var. *minor*.
 - Bristles upwardly barbed. Var. *minor*, forma *controversa*.
- b. Bristles smooth. Var. *minor*, forma *discutiens*.

R. GLOMERATA (L.) Vahl, var. **typica**. *Schoenus glomeratus* L. Sp. Pl. i. 44 (1753). *R. glomerata* (L.) Vahl, Enum. ii. 234 (1805); Blake, RHODORA, xx. 26, fig. 1 (1918). *R. paniculata* Gray, Ann. Lyc. N. Y. iii. 211, t. vi. fig. 21 (1835), not Presl (1828). *R. glomerata*, var. *robustior* Kunth, Enum. ii. 296 (1837). *R. glomerata*, var. *paniculata* (Gray) Chapm. Fl. So. States, 528 (1860); Britton, Trans. N. Y. Acad. Sci. xi. 88—repr. 15 (1892).—Florida to Texas, north to Delaware, Maryland, Tennessee, Arkansas and Oklahoma.

Var. MINOR Britt. Trans. N. Y. Acad. Sci. xi. 88—repr. 15 (1892). *Schoenus capitellatus* Michx. Fl. Bor.-Am. i. 36 (1803), in part. *R. capitellata* (Michx.) Vahl, Enum. ii. 235 (1805); Blake, RHODORA, xx. 27 (1918). *R. glomerata* Gray, Ann. Lyc. N. Y. iii. 217, t. vi. fig. 29 (1835) and later authors up to 1918. *R. glomerata*, var. *leptocarpa* Chapm. in Britt. l. c. (1892), the slenderest state, of swampy woods and thickets. *R. capitellata*, var. *minor* (Britt.) Blake, RHODORA, xx. 28, fig. 2 (1918). *R. capitellata*, var. *leptocarpa* (Chapm.) Blake, l. c. fig. 5 (1918). *R. leptocarpa* (Chapm.) Small, Man. 181, 1503 (1933).—Florida to Texas, north to Nova Scotia, New Brunswick, northern New England, northern New York, southern Ontario and Wisconsin.

Var. MINOR, forma **controversa** (Blake), comb. nov. *R. capitellata*, var. *controversa* Blake, RHODORA, xx. 28, fig. 3 (1918). *R. Smallii* Britt. in Small, Fl. Se. U. S. 1321, 1327 (1903).—Scattered in the range of var. *minor*, New Jersey and eastern Pennsylvania to North Carolina.

It is significant of the overemphasis which has been placed on the fickle characters of the bristles (as to their barbing) that Britton should have treated *R. glomerata*, var. *discutiens* and *R. capillacea*, var. *leviseta* (both with smooth instead of retrorsely barbed bristles) as mere varieties or as unworthy recognition (Ill. Fl. ed. 2) and *R. cephalantha* Gray (*R. axillaris* Britt. as to plant, not *Schoenus axillaris* Lam.) with upwardly (instead of retrorsely) barbed bristles as apparently nonexistent, while *R. glomerata*, var. *minor* with the bristles upwardly barbed was treated as a distinct species.

In fact, *R. cephalantha* (PL. 391, FIGS. 2 and 3) has the bristles either upwardly or downwardly serrulate in the same colony. When he described this species Gray, Ann. Lyc. N. Y. iii. 219 (1835), said of it: "A most remarkable circumstance with regard to this species, and so far as my observation extends, peculiar to it, is the diversity in the direction of the hispidness of the bristles: even in different individuals from the same cluster some of the bristles are hispid upward and others downward."

As to var. *leptocarpa*, as already stated, I can find no character of sufficient definiteness to keep it apart. Plants of the southern Coastal Plain, wandering into swampy woods and thickets (instead of growing in the open habitats) become attenuated in all parts and paler and seem to be what Chapman originally had. To me they are merely "drawn" and narrow-leaved responses to unfavorable conditions.

Var. MINOR, forma **discutiens** (Clarke), comb. nov. *R. glomerata*, var. *discutiens* Clarke in Britt. Trans. N. Y. Acad. Sci. xi. 88 (1892). *R. capitellata*, var. *discutiens* (Clarke) Blake, RHODORA, xx. 28, fig. 4

(1918).—Occasional, often abundant, in the range of typical var *minor*, Nova Scotia to Wisconsin and North Carolina.

An explanation is necessary regarding *Rynchospora axillaris* (Lam.) Britt. Lamarck gave the briefest of diagnoses:

643. *SCHOENUS axillaris*.

S. culmo triquetro folioso, corymbis minimis alternis axillaribus, spiculis confertis.

E. Carolina. D. Fraser.

Kunth, whose *Rynchospora glomerata* included the smaller var. *minor*, i. e. *R. capitellata*, and who called the largest southern extreme (which Blake has shown to be true *R. glomerata*) *R. glomerata*, β . *robustior*, had no hesitation in placing *Schoenus axillaris* in the synonymy of his *R. glomerata*: "*Schoenus axillaris* Lam. *Ill.* 1. 137. (*fide herb. Willd.*)"—Kunth *Enum.* ii. 296 (1837); and he recognized *R. cephalantha* Gray, *Ann. Lyc. N. Y.* iii. 218 (1836), without doubt, as a distinct species (Kunth. l. c. 540). But Boeckeler, who had a very confused conception of American *Cyperaceae*, completely tangled matters. I do not venture to untangle his snarls, further than to point out that he took up *R. cephalantha* as a species and in its synonymy placed three wholly different species which no one knowing *Rynchospora* would merge with the almost unique *R. cephalantha* (PL. 391, FIGS. 2 and 3). Boeckeler's synonymy of his *R. cephalantha* was: "*R. glomerata* Kunth, 296 partim.—*R. distans* Willd. herb. no. 1141, f. 1.—*Schoenus axillaris* Lam. (*fide specim. in Herb. Willd.*)—*Schoenus capitellatus* Michx. l. c. 36 (v.s.)." That is certainly a catholic view of a species: as to *R. glomerata* see above; *R. distans* (Michx.) Vahl is a very different species of the southern coastal plain and the West Indies, with nearly filiform leaves and tiny inflorescences; *Schoenus capitellatus* is, as already sufficiently emphasized, the wide-ranging plant, extending northward into Canada, which has long passed (erroneously) as typical *R. glomerata*; and Kunth had explicitly stated that *S. axillaris* was the same as *S. capitellatus*. Nevertheless, notwithstanding Boeckeler's complete misunderstanding of *R. cephalantha*, the latter species was submerged by Britton wholly on the basis of Boeckeler's misinterpretation:

"*RHYNCHOSPORA AXILLARIS* (Lam.) (*Schoenus axillaris*, Lam., *Encyc.* i., 137 (1791); *R. cephalantha*, Gray, *Ann. Lyc. N. Y.* iii., 218 (1836). In taking up the name I am guided by Boeckeler in *Linnaea*, xxxvii., p. 572, who states that he saw a specimen named by Lamarck in Willdenow's Herbarium."—Britton, *Bull. Torr. Bot. Cl.* xv. 104 (1888).

Since all other species referred by Boeckeler to his *Rynchospora*

cephalantha are surely not conspecific with it, it has seemed important to learn exactly what Lamarck had before him when he described *Schoenus axillaris*. This, happily, has been possible through the great kindness of Professor Humbert of the Muséum National d'Histoire Naturelle in Paris, who has supplied me with a photograph of Lamarck's type (our PL. 391, FIG. 1). The specimen is hopelessly young, a mere fragment from a very young inflorescence, but that it is not *R. cephalantha* (FIGS. 2 and 3) is perfectly apparent.

Personally I cannot match it with any degree of certainty. Its prolonged bracts, much longer than in any *mature* material known to me, and its wholly immature spikelets are so nearly impossible to match, that, in a genus with specific characters chiefly in the mature achenes it would be very unwise to attempt to displace a well defined specific name by the essentially unrecognizable *R. axillaris* (Lam.) Britton, as to type.

It thus seems clear that, in spite of the unfortunate synonymy given by Boeckeler and the faith in his judgment shown by Britton, *Rynchospora cephalantha* stands out as a species free from earlier nomenclatural entanglements. One later such alliance, however, needs dissolving. This is *R. axillaris*, var. *microcephala* Britton, Trans. N. Y. Acad. Sci. xi. 89—repr. 16 (1892) or *R. microcephala* Britton in Small, Fl. Se. U. S. 195 and 1327 (1903). This was originally defined merely as having "Heads smaller; spikelets only about 1 mm. wide" and was maintained as a small-headed extreme of *R. axillaris* in Britton & Brown, ed. 1, and by Robinson & Fernald; Small took it up in 1903 as a species, ascribing it to Britton, but in 1913 (Ill. Fl. ed. 2) Britton repudiated it, placing it, as *R. axillaris microcephala* in the synonymy of his *R. axillaris* and not mentioning *R. microcephala*. Britton's later view was apparently covered by the comment under *R. axillaris*: "Southern races have much smaller heads and smaller achenes than northern ones."

In geographic range I find little difference. Typical *Rynchospora cephalantha* (*R. "axillaris"* of Britton's treatment) extends from Mississippi to Florida, thence to Long Island; *R. microcephala* is also in Mississippi and Florida, but its northern range stops in New Jersey. But the two seem as distinct as any two paired species of *Rynchospora*. I make out the following diagnostic points which seem to indicate that they are not merely large and small variations of a single species but are quite separate entities.

R. CEPHALANTHA. Inflorescence occupying less than 1/3 the height of

the plant, glomerules strictly terminal or in 1-3(-4) of the upper axils; spikelets 5-7 mm. long; achenes 2.2-2.6 mm. long, 1.4-1.6 mm. broad. FIGS. 2 and 3.

R. MICROCEPHALA. Inflorescence occupying $\frac{1}{3}$ - $\frac{2}{3}$ the height of the plant, glomerules in 2-6 of the upper axils; spikelets 3-4 mm. long; achenes 1.5-2 mm. long, 0.8-1.2 mm. broad. FIGS. 4 and 5.

So far as I have been able to determine, the measurements of spikelets and achenes do not merge. An inflorescence of *R. cephalantha* $\times 1$, is shown in FIG. 2, of *R. microcephala*, $\times 1$, in FIG. 4; an achene of *R. cephalantha*, $\times 10$, in FIG. 3, of *R. microcephala*, $\times 10$, in FIG. 4. The illustrations of *R. microcephala* are from Fernald & Long, no. 3785, from pine barrens south of Grassfield, Norfolk Co., Virginia.

R. FASCICULARIS (Michx.) Vahl. Local: wet peaty depressions in sandy pineland, The Desert, Cape Henry, nos. 3789, 3790.

Apparently the first record from north of North Carolina.

R. WRIGHTIANA Boeckl. Local: damp sandy and peaty depressions back of the dunes, Rifle Range, south of Rudy Inlet, no. 3797, also *F. G. & L.*, no. 4577, there associated with *R. rariflora*.

The first record of *R. Wrightiana* from north of North Carolina.

R. RARIFLORA (Michx.) Ell. With the last, abundant and forming dense tussocks, no. 3791, also *F. G. & L.*, no. 4576.

R. CYMOSA Ell., var. *GLOBULARIS* Chapm. Local: same locality as the two preceding, no. 3794, also *F. G. & L.*, no. 4575; typical *R. CYMOSA* in clay ditches bordering pine woods, Virginia Beach, no. 3795.

R. CADUCA Ell. Margin of thicket bordering inundated swale back of the dunes, south of False Cape, no. 3800; boggy swale by Northwest River, Northwest, *F. G. & L.*, no. 4578.

Slight extension northward, from North Carolina.

R. INEXPANSA (Michx.) Vahl. One of the common species of wet thickets and peats: Pungo Causeway, *F. & G.*, no. 2775; Blackwater River, no. 3799; Dam Neck, no. 3798.

Spikelets often altered into finely echinate spherical galls.

CLADIUM JAMAICENSIS Crantz. Local: border of inundated woods north of Blackwater River, no. 3801.

Although already known from southeastern Virginia, the giant Saw Grass is not common there. The only place we saw it was slightly north of the Blackwater in the flooded woods bordering North Landing River, where it makes a characteristic growth.

SCLERIA SETACEA Poir. Damp sandy and peaty depressions back of the dunes, Rifle Range, south of Rudy Inlet, no. 3803.

CAREX MUHLENBERGII Schkuhr. Apparently frequent in woods: